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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,068	11/12/2003	Romney R. Kati	P02,0479(H0004233)	6347

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09/08/2005

HONEYWELL INTERNATIONAL INC.

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EXAMINER

NGUYEN, DAO H

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,068

Applicant(s)

KATTI, ROMNEY R.

Examiner

Dao H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 28-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, and 13-23 is/are rejected.
- 7) ☒ Claim(s) 10-12 and 24-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0405</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action is in response to the communications dated 11/12/2003 through 08/19/2005.

Claims 1-47 are active in this application.

Acknowledges

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 04/21/2005. The references cited on the PTOL 1449 form have been considered.

Applicant is requested to cite any relevant prior art if being aware on form PTO-1449 in accordance with the guidelines set for in M.P.E.P. 609.

Election/Restriction

3. Application's election to prosecute the invention of Group I, claims 1-27, drawn to semiconductor devices, filed 08/19/2005 is acknowledged.

Because Applicant did not distinctly and specifically point out the supposed error in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 28-47 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a non-elected group there being no allowable generic or linking claim.

Applicant has the right to file a divisional application covering the subject matter of the non-elected claims.

Drawings

4. The drawings are objected to for the following reasons.

Figure 1 is not designated by a legend such as "Prior Art". The Legend is necessary in order to clarify what applicant's invention is (see MPEP § 608.02g).

A proposed drawing correction or corrected drawings are required in reply to the Office Action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. However, formal correction of the noted defect(s) can be deferred until the application is allowed by the examiner (see MPEP § 608.02v).

Specification

5. The specification has been checked to the extent necessary to determine the presence of possible minor errors. However, the applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim(s) 1-6 are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent No. 6,714,444 to Huai et al.

Regarding claim 1, Huai discloses a giant magnetoresistive memory device, as shown in figs. 1, 3-4, comprising:

a magnetic storage layer 4 or 104 (fig. 1 or fig. 3, respectively);

a magnetic sense layer 8 or 108;

a non-magnetic spacer layer 6 or 106 between the magnetic sense layer 8/108 and the magnetic storage layer 4/104; and,

an antiferromagnetic layer 2 or 102 formed in proximity to the magnetic storage layer 4/104 whereby the antiferromagnetic layer 2/102 couples magnetically in a controlled manner to the magnetic storage layer 4/104 such that the magnetic storage

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layer 4/104 has uniform and/or directional magnetization. See also col. 1, line 14 to col. 2, line 67; col. 6, line 65 to col. 8, line 55.

Regarding claim 2, Huai discloses the giant magnetoresistive memory device wherein the magnetic storage layer 4 comprises a ferromagnetic alloy. See col. 7, lines 43-65.

Regarding claim 3, Huai discloses the giant magnetoresistive memory device wherein the magnetic storage layer comprises ferromagnetic multilayers. See col. 7, lines 7-13, and lines 43-65; col. 10, lines 34-64.

Regarding claim 4, Huai discloses the giant magnetoresistive memory device wherein the storage layer 4/104 is between the non-magnetic spacer layer 6/106 and the antiferromagnetic layer 2/102, and wherein the non-magnetic spacer layer 6/106 is between the storage layer 4/104 and the sense layer 8/108. See figs. 1, 3.

Regarding claim 5, Huai discloses the giant magnetoresistive memory device wherein the magnetic storage layer 4/104 comprises a ferromagnetic alloy. See col. 7, lines 43-65.

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Regarding claim 6, Huai discloses the giant magnetoresistive memory device wherein the magnetic storage layer 4/104 comprises ferromagnetic multilayers. See col. 7, lines 7-13, and lines 43-65; col. 10, lines 34-64.

8. Claim(s) 1, and 7-9 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,469,873 to Maruyama et al.

Regarding claim 1, Maruyama discloses a giant magnetoresistive memory device, as shown in fig. 1D, comprising:

- a magnetic storage layer 44;

- a magnetic sense layer 47;

- a non-magnetic spacer layer 46 between the magnetic sense layer 47 and the magnetic storage layer 44; and,

- an antiferromagnetic layer 45 formed in proximity to the magnetic storage layer 44 whereby the antiferromagnetic layer 45 couples magnetically in a controlled manner to the magnetic storage layer 44 such that the magnetic storage layer 44 has uniform and/or directional magnetization.

Regarding claim 7, Maruyama discloses the giant magnetoresistive memory device wherein the antiferromagnetic layer 45 is between the non-magnetic spacer layer 46 and the storage layer 44, and wherein the non-magnetic spacer layer 46 is between the antiferromagnetic layer 45 and the sense layer 47. See fig. 1D.

Regarding claim 8, Maruyama discloses the giant magnetoresistive memory device wherein the magnetic storage layer 44 comprises a ferromagnetic alloy. See col. 7, lines 56-67.

Regarding claim 9, Maruyama discloses the giant magnetoresistive memory device wherein the magnetic storage layer comprises ferromagnetic multilayers. See col. 7, line 56 to col. 8, line 12.

9. Claim(s) 13-23 are rejected under 35 U. S. C. § 102 (e) as being anticipated by U.S. Patent Application No. 2003/0184918 to Lin et al.

Regarding claim 13, Lin discloses a giant magnetoresistive memory device, as shown in fig. 6-8, comprising:

- a magnetic storage layer 617;
- a magnetic sense layer 625-631;
- a non-magnetic spacer layer 624 between the magnetic sense layer 625-631 and the magnetic storage layer 617;
- a first antiferromagnetic layer 616 formed in proximity to the magnetic storage layer 617 whereby the first antiferromagnetic layer 616 couples magnetically in a controlled manner to the magnetic storage layer such that the magnetic storage layer has uniform and/or directional magnetization; and,
- a second antiferromagnetic layer 632 formed in proximity to the magnetic sense layer 625-631 whereby the second antiferromagnetic layer 632 couples magnetically in

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a controlled manner to the magnetic sense layer such that the magnetic sense layer has uniform and/or directional magnetization.

Regarding claim 14, Lin discloses the giant magnetoresistive memory device wherein the magnetic storage layer comprises a ferromagnetic alloy. See paragraphs [0042], [0048]-[0054].

Regarding claim 15, Lin discloses the giant magnetoresistive memory device wherein the magnetic storage layer comprises ferromagnetic multilayers. See figs. 6-8, and paragraph [0042].

Regarding claim 16, Lin discloses the giant magnetoresistive memory device wherein the magnetic sense layer comprises a ferromagnetic alloy. See paragraphs [0048]-[0054].

Regarding claim 17, Lin discloses the giant magnetoresistive memory device wherein the magnetic sense layer comprises ferromagnetic multilayers. See figs. 6-8 and [0048]-[0054].

Regarding claim 18, Lin discloses the giant magnetoresistive memory device wherein the magnetic sense layer comprises a first ferromagnetic alloy, and wherein the magnetic storage layer comprises a second ferromagnetic alloy. See figs. 6-8.

Regarding claim 19, Lin discloses the giant magnetoresistive memory device wherein the magnetic sense layer comprises first ferromagnetic multilayers, and wherein the magnetic storage layer comprises second ferromagnetic multilayers. See figs. 6-8.

Regarding claim 20, Lin discloses the giant magnetoresistive memory device wherein the storage layer is between the non-magnetic spacer layer and the first antiferromagnetic layer, and wherein the sense layer is between the non-magnetic spacer layer and the second antiferromagnetic layer.

Regarding claims 21-23, Lin discloses the giant magnetoresistive memory device comprising all claimed limitations. See figs. 6-8.

Allowable Subject Matter

10. Claim(s) 10-12 and 24-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, since the prior art of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed giant magnetoresistive memory device (in addition to the other limitations in the claim) wherein the storage layer is between a first and a second antiferromagnetic layers,

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wherein the second antiferromagnetic layer is between the non-magnetic spacer layer and the storage layer, and wherein the non-magnetic spacer layer is between the second antiferromagnetic layer and the sense layer (claim 10); or wherein the first antiferromagnetic layer comprises first and second storage antiferromagnetic layers, the storage layer is between the first and second storage antiferromagnetic layers, and wherein the second antiferromagnetic layer comprises first and second sense antiferromagnetic layers, the second storage antiferromagnetic layer is between the storage layer and the non-magnetic spacer layer, wherein the sense layer is between the first and second sense antiferromagnetic layers, and wherein the second sense antiferromagnetic layer is between the sense layer and the non-magnetic spacer layer (claim 24).

Conclusion

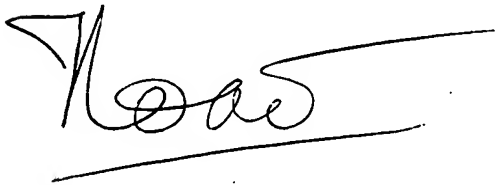
11. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao H. Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday, 9:00 AM – 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's


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supervisor, David Nelms can be reached on (571)272-1787. The fax numbers for all communication(s) is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

A handwritten signature in black ink, appearing to read 'Dao H. Nguyen', with a long horizontal stroke extending to the right.

Dao H. Nguyen
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September 2, 2005

A handwritten signature in black ink, appearing to read 'David Nelms', with a large loop at the top.

David Nelms
Supervisory Patent Examiner
Technology Center 2800